

## CHAPTER 1

### INTRODUCTION

1-1. Purpose. This manual provides guidance for incorporating environmental considerations into the engineering, design, construction, operation, and maintenance of coastal shore protection projects.

1-2. Applicability. The manual is applicable to all Corps field operating activities having civil works responsibilities in the area of coastal shore protection.

1-3. Scope. Selection of the best environmental and engineering solution to a specific coastal problem requires a systematic and thorough study because of the complexity of coastal projects and the diversity of coastal environments. The prerequisites to such a study are a clear definition of the problem and cause of the problem and then a comprehensive review of potential solutions (alternatives). This manual addresses both natural and human-induced changes in the coastal zone; the structural and nonstructural measures that coastal engineers employ against these changes; and the beneficial and adverse impacts of these measures. Immediate and long-term impacts in the project area, as well as adjacent environments, are summarized. In addition, this manual emphasizes potential steps for obtaining desirable results and reducing adverse impacts. The manual focuses primarily on shore protection, i.e., coastal projects designed to stabilize the shore against erosion related principally to current and wave action; however, the material is also applicable to harbor and navigation channel improvements. The manual applies to both the Great Lakes and the coastal marine systems. It identifies the principal environmental factors that should be considered in design and construction and provides techniques for attaining environmental quality objectives. Proper techniques for collection, analysis, and interpretation of environmental data to use in planning and engineering are outlined. This manual is intended to be compatible and used in conjunction with other OCE engineering manuals and the Coastal Engineering Research Center's "Shore Protection Manual" (US Army Engineer Waterways Experiment Station 1984). As new information becomes available, this manual will be periodically revised.

1-4. References. The Corps references listed below provide guidance to field personnel concerned with planning, design, construction, operation, and maintenance of coastal shore protection projects.

- a. ER 200-2-2, Procedures for Implementing NEPA.
- b. ER 1105-2-10, Planning Programs.
- c. ER 1105-2-20, Projects Purpose Planning Guidance.
- d. ER 1105-2-35, Public Involvement and Coordination.

- e. ER 1105-2-50, Environmental Resources.
- f. ER 1110-2-400, Design of Recreation Sites, Areas, and Facilities.
- g. ER 1110-2-1403, Hydraulic and Hydrologic Studies by Corps Separate Field Operating Activities and others.
- h. ER 1110-2-8102, Model Testing at Waterways Experiment Station.
- i. ER 1110-2-1404, Deep-Draft Navigation Project Design.
- j. ER 1130-2-307, Dredging Policies and Practices.
- k. ER 1165-2-130, Federal Participation in Shore, Hurricane, Tide, and Lake Flood Protection.
- l. EM 1110-1-400, Recreation Planning and Design Criteria.
- m. EM 1110-2-1202, Environmental Engineering for Deep-Draft Navigation.
- n. EM 1110-2-1614, Design of Coastal Revetments, Seawall, and Bulkheads.
- o. EM 1110-2-2502, Retaining Walls.
- p. EM 1110-2-2904, Design of Breakwaters and Jetties.
- q. EM 1110-2-2906, Design of Pile Structures and Foundations.
- r. EM 1110-2-3300, Beach Erosion Control and Shore Protection Studies.
- s. EM 1110-2-5025, Dredging and Dredge Material Disposal.
- t. EM 1110-2-5026, Dredged Material Beneficial Uses.
- u. EP 1165-2-1, Digest of Water Resources Policies and Authorities.

1-5. Appendices.

a. Bibliography. Bibliographical references are indicated throughout the text by last names of authors listed alphabetically in Appendix A. The WES reports referenced are available on loan from the Technical Information Center, US Army Corps of Engineer, Waterways Experiment Station, PO Box 631, Vicksburg, Mississippi 39180-0631.

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b. Models. Appendix B contains information on both numerical and physical models available for environmental studies. The capability of each model is briefly discussed and its source is identified.

c. Regulations. Federal regulations related to implementing coastal shore protection projects are listed in Appendix C. All projects will also need to achieve compliance (most likely through the local sponsor) with state or territorial, county, and other local government statutes.

d. Species Profiles. A list of published and unpublished estuarine/marine species profiles is provided (Appendix D). The profiles give brief but comprehensive sketches of the biological characteristics and environmental and habitat requirement of coastal fish and invertebrates.

1-6. Glossary. Definitions of key terms frequently used are provided at the end of this manual.